

**PRODUCTION OF HYDROGEN BASED ON COMBINED TORREFACTION  
AND GASIFICATION PROCESS**

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AND GASIFICATION PROCESS**

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for the award of the degree of  
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### **SUPERVISOR'S DECLARATION**

We hereby declare that we have checked this thesis and in our opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Chemical Engineering.

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**STUDENT'S DECLARATION**

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree

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Dedicated to my parents, family, teachers and my friends.

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**LIST OF SYMBOLS**

min	minute
°C	degree Celcius
K	Kelvin
g	gram

**LIST OF ABBREVIATIONS**

CH <sub>4</sub>	Methane
CHNS	Carbon-Hydrogen-Nitrogen-Sulphur
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
FC	Fixed carbon
GCC	Gult Cooperation Council
H <sub>2</sub>	Hydrogen gas
HHV	High Heating Value
MC	Moisture content
OPEC	Organization of the Petroleum Exporting Countries
SO <sub>2</sub>	Sulphur dioxide
TGA	Thermogravimetric Analyzer
VM	Volatile matter